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Family Tuberculosis.—In 150 white households in Williamson County, Tennessee, a clinic study was made to determine the epidemiology of tuberculosis within the family. Each household had in residence a person known, or suspected, to have some form of adult-type pulmonary tuberculosis. This person was known as "the index case." The index cases were classified in 4 types: (*1*) fatal with sputum positive; (*2*) manifest tuberculosis, sputum negative, or unknown; (*3*) manifest tuberculosis, arrested; (*4*) negative. The 150 households contained 672 persons, of whom 495 were examined. Of 412 persons tested with 0.01 mgm. and 1.0 mgm. of tuberculin, 278 were positive. Reactions were most frequent in those persons in contact with the most severe type of index case. Of the 412 contacts tested, 52 per cent reacted to 0.01 mgm. and 18 per cent to 1.0 mgm. of tuberculin. In the under-5-years age group practically all reactions were to 0.01 mgm. of tuberculin. Also this age child is more prone to be infected in the home than is the 5–14 year child or older person. Percentages of tuberculin reactors under 25 years decrease with the decreasing severity of the index case. The total percentages positive for the 4 index types are 79, 67, 61 and 47. X-ray examination shows that manifest or latent apical tuberculosis is highest in the contacts of the most severe type of index case and lowest in the contacts of those classed as negative. The percentage of those with manifest, manifest arrested and latent apical tuberculosis increases with age. The serious forms of childhood type tuberculosis are found in the early age groups. Fifty-one per cent of the contacts show evidence of infection, while 11 per cent show evidence of manifest or latent apical tuberculosis. Since the time and personnel necessary for a comprehensive tuberculosis program are limited, it may be possible to modify the program as hereby illustrated. The importance of frequent sputum examinations and close check on persons in contact with sputum positive cases are emphasized. Summary: *1:* The results of household contacts of four types of index cases are presented. *2:* The group of contacts in households with a more severe type of index case is infected in a larger proportion, and the presence of an allergic condition is more readily demonstrable. *3:* This group of contacts shows a higher proportion with the adult type of tuberculosis. *4:* The effect of household contact is more demonstrable in the younger age groups. *5:* Tuberculin testing of contacts does not identify all individuals who have been infected. *6:* It is possible to plan a program of case-finding and follow-up, taking into consideration the type of index case in a household, so that more can be accomplished in the same amount of time.—*Tuberculosis Studies in Tennessee. A Clinic Study with Reference to Epidemiology within the Family, H. C. Stewart, R. S. Gass & Ruth R. Puffer, Am. J. Pub. Health, July, 1936, xxvi, 689.*—(*S.O.P.*)

First-Infection Tuberculosis in Adults.—Studies were made on students whose tuberculin reaction had been negative

on admission to school but subsequently became positive. These were largely students of nursing and of medicine who at some time during their courses of study came in contact with tuberculous patients. Many of these stuents have, in the nine years or less of observation since their first positive reaction to tuberculin, shown no other signs of tuberculosis either clinical or roentgenological. Two students developed erythema nodosum. The first case appeared in a girl who four months previously had not reacted to tuberculin. At the time of her illness she gave a strongly positive reaction. No clinical or roentgenological evidence of a localized tuberculous process was obtained. The second case occurred in a student whose tuberculin test was first observed to be positive one week following a three weeks' service with tuberculous patients. One month later he developed erythema nodosum. Roentgenograms of his chest taken one and two years previously were normal. One year following the erythema nodosum he developed a tuberculous abscess in the soft tissues beneath the right clavicle. Roentgenograms of his chest taken one month after this last development showed no evidence of disease in either lung. Roentgenograms of the chests of twenty-one students whose reactions had been observed to change from negative to positive (in most cases during or shortly after contact with tuberculous patients) showed evidence of infiltration of varying degrees in the pulmonary parenchyma, but in the almost complete absence of clinical symptoms. It is almost impossible to differentiate roentgenograms of these infiltrations from those of the reinfection type and only the absence of symptoms, the persistent homogeneity of the lesion and the latter's tendency very gradually to regress over a period of many months will give assurance that one is dealing with a first-infection type of tuberculosis. Eighteen students whose reaction to tuberculin changed from negative to positive developed pleurisy with effusion. Primary parenchymal lesions had been demonstrated roentgenographically in some of these cases several weeks to many months prior to the development of the effusion. In other instances none had been made out. There were other cases in which no roentgenograms had been taken following the first positive tuberculin test and prior to the onset of the pleural effusion. In some of these a primary parenchymal lesion could be seen at the time of the effusion. The authors feel that these pleural effusions are a reinfection form of tuberculosis which develops from the focus of the first infection and may follow rather closely upon the development of the first-infection type of tuberculosis, even more frequently in adults than in children. This may, however, be more apparent than real for slight effusions may easily pass unnoticed in infants and children. Twenty-five students whose reaction to tuberculin changed from negative to positive developed typical reinfection type of tuberculosis. Although tuberculin tests were not done frequently enough to permit absolute certainty as to the type of disease present, in most of this group sufficient time had elapsed between the first positive test and the first roentgenological and clinical evidence of pulmonary tuberculosis to make this a reasonable assumption. In some instances two to six years had elapsed. The tuberculous disease in these students was no more severe than in adults whose primary type of infection had occurred in childhood. Fifteen students whose first tuberculin tests were positive, and in whom roentgenograms of the chest were normal, developed pulmonary tuberculosis. Four students who had had normal roentgenograms of the chest but no tuberculin tests developed pulmonary tuberculosis. These last two groups belie the statement that during the teen age period a roentgenogram of the chest will reveal evidence of any disease which may cause illness at a later time in life. There was no tuberculous meningitis or miliary disease in any of these eighty-five cases here reported. This report indicates that it makes little if any difference at what time of life the first infection with the tubercle bacillus occurs with reference to the evolution of tuberculosis. In order to differentiate the roentgenograms of the first-infection and the reinfection type of pulmonary tuberculosis in students of nursing and medicine who did not previously react to tuberculin the tuberculin test should be administered at least every six months.—*Development of Tuberculosis in Adult Life, J. A. Myers, H. S. Diehl, Ruth E. Boynton & Benedict Trach, Arch. Int. Med., January, 1937, lix, 1.*—(*C. L. D.*)

Tuberculosis in Negro Families.—The authors studied the spread of tuberculosis in some Negro families exposed to cases of tuberculosis with tubercle bacilli in their sputum, in other families exposed to tuberculosis with no tubercle bacilli in their sputum and in families with no known exposure to tuberculosis. The amount of tuberculous infection was determined by means of the intracutaneous tuberculin test. In the Negro families where tuberculosis with tubercle bacilli was present, 80 per cent of those under 5 years of age reacted,

and after 15 years of age approximately 100 per cent reacted. In families where sputum negative cases of tuberculosis occurred 26.7 per cent of those under 5 years reacted, and after 15 years approximately 100 per cent. In households where there were no known cases of tuberculosis 7.9 per cent of those less than 5 years of age reacted and after 15 years approximately 90 per cent reacted. Lesions demonstrable by X-ray were observed in 31.4 per cent of those under 5 years of age, living in contact with cases of tuberculosis with tubercle bacilli in their sputum. X-ray demonstrable lesions in the age group under 29 were more frequent among white than among colored contacts. In families with cases of tuberculosis with no tubercle bacilli in their sputum 5 per cent of those under 5 years of age showed demonstrable lesions, while in members under 5 years of age living in families with no tuberculosis no lesions were found. Tuberculosis of first-infection type occurred with a greater degree of frequency among the Negro families than among the white families. It was observed among the Negro families in all age groups up to 59 years, whereas in white families it was seldom observed after 15 years of age. These lesions show less tendency to heal and calcify in members of Negro families. Latent apical tuberculosis is less frequent among Negroes than among whites. Roentgenologically demonstrable lesions were not observed in persons who failed to react to tuberculin. From 40 to 47 per cent of those who reacted to 0.1 to 0.01 mgm. of tuberculin had lesions demonstrable by X-ray.—*The Spread of Tuberculosis in Negro Families, F. M. McPhedran & E. L. Opie, Am. J. Hyg., May, 1936, xxiii, 493.*—(*J. D. A.*)

Frequency of Tuberculosis in Whites and Negroes.—The authors determined the frequency of occurrence of secondary cases of tuberculosis in households harboring manifest cases of this disease. They found that in white persons under 15 years of age exposed to tuberculosis approximately 5 per cent developed manifest disease, while 10 per cent of those older than 15 years developed this disease. In Negroes the frequency of manifest tuberculosis in those exposed was approximately 8 per cent for those under 9 years, 11 per cent for those between the ages of 10 and 14, and 15 per cent for those over 15 years of age. From 90 to 96 per cent of primary and 55 to 60 per cent of secondary cases occur in adults. Among white persons the ratio of person years observed to deaths was 14.7 for primary cases and 10.8 for secondary cases, while among colored persons the ratio was 4.9 for primary cases and 2.9 for secondary cases. The ratio of manifest tuberculosis to deaths was found to be 12.2 for white and 4.3 for Negro patients. Among white patients one-third had tubercle bacilli in their sputum and among Negro patients one-half. Tuberculous lesions in the Negro are less frequently asymptomatic than among white persons.—*The Relative Frequency of Clinically Manifest Tuberculosis, Open Tuberculosis, Asymptomatic Lesions and Deaths in White and Negro Persons, E. L. Opie, F. M. McPhedran & P. Putnam, Am. J. Hyg., May, 1936, xxiii, 530.*—(*J. D. A.*)

Contact Tuberculosis in Negroes.—The fate of Negroes in contact with tuberculosis was studied over a period of 15 years. Of those under 10 years of age in contact with tuberculosis 2.6 per cent developed manifest disease and 1.6 per cent died during the first 2 years of exposure. Subsequently the frequency of this disease falls. When contact with tuberculosis was established between the ages from 10 to 14 years the incidence reached a maximum of 10.1 per cent and the death rate rose to 6.7 per cent. Contact beginning after 15 years of age was associated with an immediate rise of tuberculosis rate, reaching an incidence of 19 per cent in the 10 to 14 year period and a death rate of 7 per cent. Tuberculosis was observed more frequently among Negroes exposed to manifest disease than among white persons similarly exposed. On the other hand latent lesions have been more frequent among white persons, than among Negroes. The authors conclude that if tuberculosis of adolescence and early childhood were endogenous, resulting from disease acquired in childhood, the death rate from tuberculosis of those first exposed after 15 years of age should not exceed that of the general population, whereas they have found that exposure after this age has been followed by a death rate which greatly exceeds that of the general population, and the infection in these cases must therefore be regarded as exogenous.—*The Fate of Negro Persons in Contact with Tuberculosis, E. L. Opie, F. M. McPhedran & P. Putnam, Am. J. Hyg., May, 1936, xxiii, 515.*—(*J. D. A.*)

Tuberculosis in Puerto Rico.—The X-ray plates of 1,000 Puerto Ricans suffering from pulmonary tuberculosis were studied, with a view to determining the prevalent forms of tuberculosis in Puerto Rico. Seventy-one per cent of the patients belonged in the age-groups between 20 and 39; 81 per cent were white, 16 per cent

mulattoes and 3 per cent black. Fifty-one per cent were females. The preponderant form of tuberculosis was the fibrocaseous. In 48 per cent exudative infiltration predominated, while in 52 per cent fibrous infiltration was equal in extent or predominated over the destructive processes. Patches of caseous pneumonic infiltration were frequent; but massive tuberculous pneumonias were rare. Miliary tuberculosis was also rare, only five cases having been found in the series. Cavities were found in 56 per cent. One or both apices were involved in 82 per cent. The lesions were limited to the upper third of one or both lungs in 46 per cent, to the middle third in 9 per cent and to the lower third in 1.5 per cent. Marked displacement of the mediastinum and other deformities due to fibrous tissue were found in 8 per cent of the cases, while 4 per cent presented total atelectasis of one lung. The nature of the lesions was the same in white and colored. The general impression gained from this X-ray survey is that the forms of tuberculosis found among Puerto Ricans are essentially similar to those that occur among the white population of other highly tuberculized communities.—*Forms of Pulmonary Tuberculosis in Puerto Rico, J. R. Pastor & G. R. Cestero, Puerto Rico J. Pub. Health & Trop. Med., March, 1936, xi, 479.*—(*J. R. P.*)

Tuberculosis in College Students.—The Tuberculosis Committee of the American Student Health Association noted that in the year 1934–1935, in seventeen colleges with 85,428 students and an active tuberculosis program, the rate for cases discovered was 5.7 per thousand; while in three other colleges, with an enrollment of 13,000 students and without an active tuberculosis program, the rate was only 1.2 cases per thousand. The only reason to be assigned for the difference is that in the one group the institutions actively sought out cases. The Henry Phipps Institute, since the summer of 1935, furnished Purified Protein Derivative without cost to those colleges or universities carrying out at least 500 complete tests, using the regulation dose of 0.000,02 mgm. for the first test and a second dose of 0.005 mgm. on those failing to react to the first injection. The results of 18,744 tests were returned for analysis. A geographic variation in the incidence of tuberculous infection was found, with relatively high rates (from 40 to 60 per cent) in the East and Far West and low rates (from 20 to 30 per cent) in the Central States. Since the majority of the students in the colleges reporting were residents of the general region of their college, the figures are believed to reflect the incidence of tuberculous infection in the populations of those regions. Excessive rates were found in regions as resorts for tuberculous patients. In colleges reporting tests on large groups of young men and women of approximately the same average age, the rate of positive tuberculin reaction was, for the most part, higher in men than in women.—*The Incidence of Tuberculous Infection in American College Students: Determination by Standardized Tuberculin (Purified Protein Derivative) on 18,744 College Entrants in 1935–1936, E. R. Long & F. B. Seibert, J. Am. Med. Assn., May 22, 1937, cviii, 1761.*—(*G. L. L.*)

Tuberculosis in Nurses.—During the five year period from 1931 to 1936 approximately one thousand nurses have been examined at periodic intervals in Sea View Hospital. All of these individuals have been in contact with tuberculosis in the course of their work. Of these there are thirty-one (three per cent) who have tuberculosis but only twenty-one (two per cent) have developed demonstrable lesions while at work and only four have developed symptomatic tuberculosis. The morbidity rate in other occupations varies from 1.1 per cent in factory workers to 0.09 per cent among lawyers, judges and justices. The morbidity rate of 2 per cent at Sea View Hospital is approximately that reported by others who have made similar surveys among nurses. The predominant type of lesion was a minimal one with slight exudation despite the fact that the nurses were of the colored race in whom one might expect massive involvement following massive exogenous infection. Within definite limits it would seem that workers in a tuberculosis institution are subjected to a definite industrial hazard and should be entitled to the benefits of existing laws of compensation. If the occupation has aided the entrance of tubercle bacilli into the body or if the environmental factors of the work enable preexisting bacilli to propagate and cause clinical tuberculosis, then that occupation must be hazardous.—*Pulmonary Tuberculosis as an Occupational Disease in a Tuberculosis Hospital, D. Ulmar, G. G. Ornstein & H. H. Epstein, Quart. Bull. of Sea View Hosp., October, 1936, ii, 49.*—(*A. A. E.*)

Tuberculosis and Practitioner.—The public is familiar with the figures often repeated showing the remarkable reduction in the death rate of tuberculosis in the past quarter of a century. It is also a fact, not so often mentioned, that the decline in the morbidity rate has kept pace with the

reduction in mortality. What is not kept foremost before the public and the medical profession is the fact that between the ages of 15 and 35 tuberculosis still accounts for more deaths in the general population than does any other disease. The problem is serious, especially when it is remembered that hospital beds are available for only about 15 to 20 per cent of those afflicted. In spite of all activities for the prevention of infections, at least 40 to 60 per cent of the population show evidence of its presence when maturity is reached. Segregation of carriers remains the only measure of approach common to all contagious diseases. But even here, there is a double limitation. Either hospitalization is available for only 15 to 20 per cent of those afflicted, or isolation is often impracticable. The early diagnosis campaign is somewhat ambiguous. The author presents statistics to prove that the detection of the disease in its earlier stages by awaiting the development of symptoms is not possible because of the insidiousness of onset. The finding of frank cases of tuberculosis can be enhanced only by methods of greater precision and by the utilization of a more extensive case-finding program. The wider use of the X-rays and less attention to physical examinations will be a great step forward. The physician falls short of his duty if he stops here. He must exert all his influence to examine all contacts or arrange for free examination, when economic conditions forbid otherwise. Attention in tuberculin testing has been shifted from grade children to the high-school groups, but even here there is controversy. Recent work seems to cast doubt on the plausibility of the universal application of mass tuberculin testing methods. The influence of the physician must be extended to include the proper management of the open case, with two things in mind: first, to segregate the patients and, second, to render the sputum abacillary by early treatment at home or in the office of those in whom this is possible. The practitioner too often temporizes or else divorces himself from the case by referring it to a tuberculosis clinic. It is important, also, to stress that the family physician should be conversant with the recent concepts of the treatment of pulmonary tuberculosis. He should aid the public health agencies in selecting those individuals who, for various reasons, require immediate hospitalization. If segregation is not immediately available, he should urge the patient suitable for collapse therapy to seek it in properly equipped clinics or from private sources, depending on the economic status of the patient.—*The Problem of Tuberculosis from the Practitioner's Point of View, B. P. Potter, J. Am. Med. Assn., May 8, 1937, cviii, 1585.*—(*G. L. L.*)

Serial Roentgen Examination.—For a three year period, a Mantoux test was performed on all new students entering the University of Wisconsin. The positive reactors were referred to the roentgenology department for a roentgenogram of the chest. The single film was used after consulting twelve recognized radiologists throughout the country regarding the value of the single film as compared with a fluoroscopic examination. In all, 2,719 students were thus examined. Normal X-ray findings were found in 76.21 per cent, evidence of previous childhood tuberculosis was reported in 21 per cent, and 2.79 per cent had evidence of adult-type lesion. Adult-type parenchymal lesions of nearly every kind were found in 45 students and apical pleuritis was present in 21 students.—*Serial Roentgen Examinations of the Chest in University Students, E. A. Pohle, L. W. Paul & S. R. Beatty, Radiol., January, 1937, xxviii, 40.*—(*G. F. M.*)

Tuberculosis and Survival in British Postal Service.—The Post Office is numerically the largest employer of labor in Great Britain, with a total staff of 185,000 men and 55,000 women, in round numbers. It embraces a variety of employments, manual, technical and clerical. Its established staff of about 121,000 men and 35,000 women is subjected before entry to a thorough medical examination. They are all between the ages of 16 and 60. Between 1914 and 1935 the incidence of tuberculosis varied, being in some years less and in others slightly higher than for the general population of England and Wales. There has been a tendency to steadily decrease and for 1935 the figure of 1.04 per 1,000 employees was the lowest on record. Between 1920 and 1935 the average incidence rate for London exceeded that for the provinces, 1.55 per 1,000 compared with 1.43. Also, the average incidence for males, 1.54 per 1,000, exceeded that for females, 1.24 per 1,000. The rate was higher among manual laborers than clerical or indoor workers, 1.92 per 1,000 in London and 1.56 per 1,000 in the provinces, as against 1.21 and 1.06 for the indoor workers. The Post Office has been accustomed to allow liberal sick leave provided there is a reasonable prospect of recovery with working capacity. Over twenty-two years, about 50 per cent, not more, have been able to resume work, and the after-history of 1,848 such persons, out of a group of 3,755

cases between 1914 and 1926 inclusive, is here analyzed. By the end of ten years there had been a further loss of 775 cases who relapsed and 110 were otherwise incapacitated, approximately 44 per cent shrinkage during the first six years after resumption, and in the next four years another 16.6 per cent. Such shrinkage was greater in the manual, mainly outdoor than in the indoor group, about 60 per cent compared with 50 per cent. Given survival for ten years, there was a further shrinkage of only 14 per cent in the next five years, a considerable proportion of which was due to causes other than tuberculosis. Of Post Office workers incurring pulmonary tuberculosis, not over 50 per cent can return to work even after prolonged treatment. Of those who return, there has been a further wastage of about 48 per cent as a result of recurrent pulmonary tuberculosis, the heaviest wastage occurring in the first six years. Light manual or clerical workers appear to have a slight advantage over heavier manual, mostly outdoor workers, and a 10 per cent advantage in respect of subsequent survival in industry. Of cured and arrested cases who survive a period of ten years, the wastage at the end of a further five years is reduced to about 14 per cent.—*Pulmonary Tuberculosis in Industry. Incidence and After History, An Analysis of 3,755 Cases, H. H. Bashford & W. L. Scott, Lancet, November 7, 1936, ccxxxi, 1115.*—(*A. P.*)

Papworth Colony.—Varrier-Jones and Sims-Woodhead decided twenty-one years ago that treatment and after-care were one and indivisible. Any rational scheme must treat the whole man or woman, and on that basis the village-settlement scheme was built. Only one important criticism persists, namely, that the scheme provides permanent after-care for so few that it is no solution. This is a false generalization from misleading premises. What limits the number taken care of is the nonmedical factor of finance. When more capital has been provided it has always been possible to settle more patients. However, the idea is deep-seated that while clinical treatment is important and worthy of State support, after-care is relatively unimportant and may be left to chance or charity. So long as this attitude persists there will be a tuberculosis problem. World-wide neglect and failure to appreciate this are delaying the fall in tuberculosis mortality. In England there is a system of Care Committees, usually lacking adequate funds, struggling to induce employers to employ discharged sanatorium patients. If these efforts fail, we have handicraft classes, extra nourishment, etc., but nothing constructive, only distractions and doles. On the other hand, at Papworth, the sales of the industries produce over 100,000 pounds a year ($500,000) from which the workers get something more than "pocket money." We do not expect bows and arrows to defeat tanks, but we expect Care Committees to perform equally impossible feats and wonder at the disappointing results. Any normally constituted consumptive is miserable until he can work again and even the excitement of a thoracic operation will not cheer him up indefinitely. Because of the wages attached to work and his discontent with idleness, he will often get away from the sanatorium too soon, while still sputum positive. Only when the disease brings him low again does he become docile, and so the silly cycle goes on. We are but playing with after-care, so fascinated by clinical factors that we ignore vital economic ones. Because of our medical blinkers we fail to see the nonmedical elements which are so important. The London Times recently published a discerning article about the distressed areas which applies equally here. The writer says, "one certain thing is that life without purpose is life without value . . . . life has lost its savour because it has lost its use." Do we lack appreciation? The homes of unemployed after-care cases are all of them distressed areas. It is well to remember this when we give out sputum flasks, study X-ray photographs and look at blood sedimentation curves.—*Papworth and the After-Care Movement in England, P. Varrier-Jones, Tubercle, September, 1936, xvii, 529.*—(*A. P.*)

Trauma and Tuberculosis.—Trauma can only be an indirect cause of tuberculosis, since the disease is dependent upon the presence of tubercle bacilli. After primary infection all dissemination is caused by an accidental eruption of tubercle bacilli into the lymph or blood vessels. Most of the reinfection forms of pulmonary tuberculosis in adult life are exogenous in origin and bronchogenic in dissemination; most of the endogenous reinfections are extrapulmonary and, of course, haematogenous. After sensitization of tissue to tubercle bacilli, the reaction to tuberculous reinfection occurs within twenty-four hours with the peak of reaction in forty-eight hours ("Koch phenomenon"); this fact is the key to the relation between trauma and tuberculosis. Following trauma there must be an immediate manifestation of the reaction to tuberculous infection if the trauma is to be con-

sidered a causative factor in activating the disease; the manifestations should appear in the lungs within twenty-four hours and no later than two weeks. Because of this, roentgenograms should be taken within forty-eight hours after thoracic injury and again at the end of two weeks in order to determine properly the effect of trauma upon reactivation of tuberculosis. In extrapulmonary tuberculosis it is more difficult to link injury to reactivation of the disease because of the long periods of time that may elapse between the injury and the recognition of tuberculosis in the bones or kidneys. Then, too, haematogenous spreads occur frequently in extrapulmonary tuberculosis and the pulmonary manifestation of the disease is recognized as the chief factor whereas the spread may have occurred following injury at the site of extrapulmonary tuberculosis. The time between injury and infection is of importance in tuberculosis of the epididymes, seminal vesicles, and superficial lymph nodes; in these organs there should be immediate evidence of reactivation following injury. Two cases demonstrating the relation of trauma to pulmonary tuberculosis are described.—*Trauma and Tuberculosis, G. G. Ornstein & D. Ulmar, Quart. Bull. of Sea View Hosp., October, 1936, ii, 69.*—(*A. A. E.*)

From Childhood Infection to Adult-Type Tuberculosis.—The first prerequisite for the development of pulmonary tuberculosis is a tuberculous infection, regardless of whether it occurs during childhood or later. The second prerequisite is a disposition to tuberculosis, acquired through heredity, arrival at the age of puberty, or nonspecific conditional factors which lower resistance. If a child acquires a primary infection and successfully passes the critical period, this child is fairly well protected in the future from the dangers of exogenous exposure to tuberculosis even under unfavorable conditions. A tranquil period then follows and usually lasts throughout life. In some, however, because of hereditary disposition or because of environmental or other unfavorable circumstances, tuberculosis develops as an endogenous process.—*From Childhood Infection to Adult Type of Pulmonary Tuberculosis, A. Wallgren, Acta Tuberc. Scandinav., 1936, Fasc. 4, x, 321.*—(*F. B. S.*)

Tuberculous Infection in Children.—This paper represents an analysis of the data obtained in the routine tuberculin testing (Mantoux) of the children admitted to the pediatric divisions of the Strong Memorial Hospital and the Rochester Municipal Hospital during the years 1926 to 1934. Of a total of approximately 5,000 children, 9.6 per cent had positive tuberculin reactions, of whom 8.3 per cent are known to have died of tuberculosis. The data in general confirmed the reports in the literature from other cities that there has been a decline in the incidence of tuberculosis. The percentages of positive reactors during the three periods of three years each covered in this report were 14.8, 9.4, and 5.6 per cent respectively. At the same time while the incidence of positive reactors was decreasing the percentage of those reactors who showed clinical or roentgenological evidence of tuberculosis showed a slight increase, the figures being 36.2, 48.1, and 52.9 per cent respectively. This indicates that the declining incidence of tuberculosis among children is not due to any attenuation in the virulence of the organism causing tuberculosis, but to the fact that fewer persons are being infected with this organism. As has been the case in other reports of the age incidence of positive reactors, the percentage among children up to the age of 5 years was considerably less (4.4 per cent) than in children from 5 to 15 years (15.6 per cent). Among the children aged 13 to 15 years the percentage of positive reactors was 41. On the other hand the percentage of reactors who had evidence of tuberculosis was higher (52 per cent) in the children under 5 than in the older group (41.5 per cent). And the death rate from tuberculosis in the reactors was much higher (23.1 per cent) in the younger group than in those 5 years or older (3.6 per cent). It is of interest that the curve of incidence of reported cases of tuberculosis in the general population of Rochester has not dropped quite as much as the curve of incidence in the hospital studies. This is probably due to the fact that during the past ten years a great effort has been made to induce physicians to report every case observed and that probably for this reason a greater proportion of cases of tuberculosis have been reported recently by physicians in general than in previous years.—*Extent and Nature of the Decline of Tuberculous Infection in Children: An Analysis of Data Concerning 4,982 Children Tested with Old Tuberculin during the Years from 1926 to 1934 Inclusive, P. W. Beaven, Am. J. Dis. Child., Sept., 1936, lii, 565.*—(*M. D.*)

Incidence of Tuberculous Infection in Childhood in Relation to Contact and Environment.—The group here studied consisted of 375 children under sixteen years old examined at the Tuberculosis Dispensary of the Springfield Health Depart-

ment. Of these, 218 gave a definite history of contact with known pulmonary tuberculosis; the others came for examination because of malnutrition, recurrent respiratory infections, or apprehension on the part of parents and others. In this group the cutaneous (Pirquet) tuberculin test was used, read after forty-eight hours. All had chest X-rays taken and the domestic hygiene was appraised by personal investigation. Of children never known to be directly exposed to a recognized case of tuberculosis 21 per cent reacted positively, compared with 57 per cent for those with a history of tuberculous contact and 63 per cent (3 times as many) where the source of contact was known to be sputum-positive. Seventy per cent of children exposed to a tuberculous father gave positive reactions, and 53 per cent of those with a tuberculous mother; in the case of exposure to siblings 38 per cent. From the tables it appears that those exposed during the second and third five-year periods showed a higher proportion of reactors than those exposed earlier in life. On the other hand, of all contact children with positive tuberculin reactions, the largest proportion received maximum exposure during the first quinquennium. It is well known that the proportion of positive reactors increases progressively with age. The duration of exposure did not seem a controlling factor, probably because the sicker cases usually died or went to an institution within a year or two, the others being more chronic and less active. Here it was found that contact children from class-A homes had almost as high an infection incidence as those from class-C homes. Neither malnutrition nor general health conditions seemed related to tuberculous infection, although nearly 40 per cent of the underweight group were tuberculin-positive. But 25 per cent of negative reactors also were 10 per cent or more underweight.—*Factors Influencing the Development of Tuberculous Infection in Childhood, A. S. Johnson, New England J. Med., August 6, 1936, ccxv, 239.*—(*A. P.*)

Tuberculosis in Infancy and Childhood.—In the child the usual absence of complications makes it easier to find the initial lesion, follow its course, interpret pathology and often assess the aetiological factor. In tuberculosis the initial infection occurs on a virgin soil and is not affected by changes caused by previous tuberculous or other lesions. Blacklock investigated 434 cases with tuberculous lesions found in a series of 3,000 necropsies over twelve years at the Royal Hospital for Sick Children, Glasgow. From an exceptionally low incidence in the first three months of life, tuberculosis rises to its peak in the third year, then falls slightly. The percentage of total necropsies revealing tuberculosis was 14.5 per cent, much lower than Comby's 36.7 per cent in Paris, and Hamburger's 39.5 per cent in Vienna. In only 36 out of all positive tuberculin reacting cases were corresponding tuberculous lesions missed. In the first three years of life the percentage of positive reactors is actually below that of the lesions found at necropsy because some young patients with severe tuberculosis failed to react. After six years of age the percentage of positive tuberculin reactors is almost double that of positive necropsy findings. The higher level of mortality in relation to the incidence of infection indicated by the Mantoux test during the first three years indicates the serious prognosis of infection at this period. Blacklock's mortality figure, expressed as a percentage of the incidence of tuberculous lesions, is higher than that reported by other European and American investigators—89.2 per cent for Glasgow, compared with Hamburger's 69 per cent for Vienna in 1903–1906, and Asserson's 51.7 per cent in a five-year follow-up of infected infants under two years in the United States. It is possible that the Celtic race is less resistant than the Germanic and also that a comparatively sunless climate lowers resistance to infection and, due to confinement, leads to more intimate contact with familial infection. It seems certain that tuberculous infection in children under 3 is always serious and Stewart, and Myers and Harrington observed that tuberculin-positive children more frequently develop fatal phthisis in later life. Blacklock believes that minimal late childhood infections behave quite differently from those acquired in infancy, confirming the views of Nassau and Zweig and others. Allergy in the human he regards as but a step in the process of developing immunity. The wholesale prophylactic use of Calmette's BCG seems questionable, for the immunity produced is not permanent and the ultimate fate of live BCG bacilli in the human body is not known, nor that pathogenic mutation may not occur. The possibility of immunizing with killed cultures has not these objections and does confer immunity in animals at least. The respiratory pathway was the route chosen in 65 per cent of the 434 cases studied. The initial pulmonary lesion is characteristic, a small localized patch of bronchopneumonia about the size of a pea. Parrot described these fully forty years before Ghon. They are usually subpleural. Infection passes rapidly to the tracheobronchial

lymph nodes, always affected, and usually out of proportion to the primary pulmonary lesion. A small imperceptible primary lesion thus causes a marked hilar tuberculosis visualized by X-ray. Foci in the lung are usually single but may be multiple. Small tubercles due to lymphatic spread and areas of epituberculosis were frequent. The incidence of healing increased with age, but calcification occurred in only 9 per cent, mostly in children over three. In most cases other types of lesions also occurred in the lungs, always more severe in younger children. The typical adult type of lesion occurred only from nine years upward. Blacklock isolated and typed 166 strains of tubercle bacilli from cases of primary respiratory tuberculosis and 96.4 per cent were human. The association with human sources of infection has been clearly shown by others. In 140 of 149 primary alimentary tuberculosis, the portal of entry was intestinal but usually nonulcerative, mesenteric lymph nodes being involved. In children under 3, death due to generalization was the rule but in older children the necropsy findings of tuberculosis were accidental in over half the cases. Of 73 strains of bacilli isolated and typed, 82.2 per cent were bovine, a higher proportion than found by Continental or American workers. The infection points clearly to milk. Primary tuberculous cervical adenitis was rare among those coming to necropsy, about 2 per cent, and the majority of strains were bovine. The use of certified, pasteurized or boiled milk is the obvious answer. —*Tuberculosis in Infancy and Childhood: With Special Reference to Its Prevention, J. W. S. Blacklock, Brit. M. J., August 15, 1936, no. 3945, 324.*—(*A. P.*)

Epituberculosis.—The clinical and X-ray findings in epituberculosis have usually been explained upon the basis of a reaction in the adjacent lung tissue to toxins produced by a tuberculous focus. There has been evidence that in some cases the findings are due to a true tuberculous pneumonia of wide extent differing from the ordinary type by undergoing complete reabsorption. There is also evidence that in some cases of epituberculosis, atelectasis plays the important rôle in the production of the physical signs and X-ray findings. This may be due to occlusion of a main bronchus by swollen hilum glands, possibly to compression of smaller bronchi or directly of lung tissue. The X-ray evidence of atelectasis varies in different instances, and cases are presented by the author to illustrate these variations. In one case the X-ray showed a collapse of the right upper lobe as typical in appearance as that due to the occlusion of the bronchus to this lobe by a foreign body. In other cases the typical shadow of epituberculosis in a lung was accompanied by definite shift of the mediastinum to the involved side, a phenomenon which in one case was seen to become more pronounced as the shadow in the lung and the corresponding area of dulness increased in size in the course of some weeks. In one child with marked displacement of the heart to the right the return of the heart to normal position accompanied the gradual disappearance of an extensive shadow in the right lung field. There remained the shadow of an infiltration of the hilum accompanied by swollen glands, which appeared to have caused the extensive collapse in the right lung. In one instance, a child with the clinical and X-ray picture of epituberculosis died of tuberculous meningitis. The autopsy revealed not only invasion and blocking of a small bronchus by a primary tuberculous focus, but occlusion of the left upper bronchus by surrounding caseous glands. There was consequent chronic atelectasis of the left upper lobe and evidence of beginning dilation of the smaller bronchi in this lobe.—*Epituberculosis, M. de Bruin, Arch. Dis. Child., April, 1936, lxii, 65.*—(*M. D.*)

Abdominal Tuberculosis in Childhood.—Most cases result from ingestion of bovine type tubercle bacilli in raw cow's milk and to a lesser extent in cream. The highest incidence is in the second year of life. A small proportion of cases are due to the human type; the lesions in such cases being usually secondary to intrathoracic tuberculosis. Intestinal ulceration occurs in about 20 per cent, usually in the lower end of the ileum, often commencing in Peyer's patches and spreading circularly. In severe cases there is coalescence and tissue destruction but perforation is rare because of walling off by adhesions. Mesenteric lymph node tuberculosis (*tabes mesenterica*) is the most common form postmortem. The lymph nodes first affected are usually in the right iliac fossa. Later higher nodes, even the paraäortic or mediastinal groups, may be affected. Occasionally the lacteals are obstructed so that fat absorption is interfered with and the stools become fatty. Often the nodes heal by fibrosis and calcification, at other times they become adherent to intestinal coils, and may later give rise to symptoms of intestinal obstruction. Infection of the peritoneum occurs primarily in the miliary form; then the peritoneum may react with effusion; its absorption may result in a plastic tuberculous peritonitis. Occasionally this de-

velops locally, with abscess, usually in the right iliac fossa. Tuberculous enteritis is usually insidious in onset, with later abdominal pains, diarrhoea, fever and wasting. Examination of the abdomen shows swelling, slight resistance, and diffuse tenderness. With *tabes mesenterica* the abdominal pains are usually vague and niggling, most marked about the umbilicus, appetite is poor, bowels irregular, and usually temperature slightly elevated. The nodes are most often palpable in the right iliac fossa as small, slightly movable pellets, often slightly tender. They may occur between the umbilicus and left costal margin. With the plastic form of tuberculous peritonitis, the abdomen is doughy, swollen, slightly tender and diffusely resistant, as though packed with cotton-wool. The omentum tends to lie in a bunched-up mass across the epigastrium, sausage shaped. The stools, in tuberculous enteritis, may show tubercle bacilli. X-ray examination of the abdomen may reveal calcified nodes. A positive intracutaneous tuberculin test is of some value in young children and a negative one has negative value if one bears in mind its disappearance in acute phases of the disease. Rest should be continued as long as indicated by temperature, pulse rate, and red blood cell sedimentation. Next comes fresh air and the child should spend as much of the day as possible outdoors on a balcony or in the garden. Short exposures of trunk and limbs to sun and air are valuable. Diet should be nourishing, eliminating roughage. As for drugs, codliver oil, malt creosote, and syrup of iodide of iron are most valuable. Tuberculin is not very effective.—*Abdominal Tuberculosis in Childhood, W. Sheldon, Lancet, November 7, 1936, ccxxxi, 1113.—(A. P.)*

Basal Metabolism in Tuberculosis.—In febrile forms of tuberculosis the increase in basal metabolism is less than in other infections with the same degree of fever. In active tuberculosis without fever, the basal metabolism in the great majority of adults studied is essentially normal. The present study was concerned with active pulmonary tuberculosis in children, aged 8 to 16 years. Of those with the adult type of reinfection (115) 80 per cent had a basal metabolism within normal limits; 12 per cent showed an elevation of more than plus 10; and 8 per cent were below minus 10. In the group with primary tuberculosis (143), afebrile but active on the basis of physical and X-ray findings, blood count, and sedimentation time, only 8.4 per cent of the patients had a basal metabolic rate within normal limits, the other 91.6 per cent having a rate above plus 10. As the tuberculous process became inactive, the basal metabolic rate fell to normal, and could be used as an additional criterion of readiness for discharge from the hospital. Reasons for the difference in metabolic response between children with primary tuberculosis and those with tuberculosis of the adult type are still theoretical, but probably lie in the fact that the primary infection is associated with intense reactivity of lymphoid tissue, while the adult type shows a more localized reactivity in the lung tissue.—*Basal Metabolism of Tuberculous Children, Anne Topper & H. Rosenberg, Am. J. Dis. Child., August, 1936, lii, 266.—(M. D.)*

Contralateral Spread in Pulmonary Tuberculosis.—Since on the vertical, posteroanterior roentgenogram the mouth of the right upper lobe bronchus is at the level of the anterior end of the second rib (almost directly opposite the carina) and that of the left upper lobe bronchus is just below the anterior end of the third rib, the areas of predilection in contralateral bronchial infection have a fairly definite location. On the right it is seen under the second rib and in the second interspace anteriorly, while on the left it lies in the third interspace anteriorly. This pattern of contralateral spilling was demonstrated with lipiodol in 8 nontuberculous individuals who received 10 cc. lipiodol in the lower bronchus of one lung and then turned on the opposite side and coughed gently for 5 minutes. All X-ray films were taken in the vertical position. On a review of 20,000 roentgenograms made at Peiping Union Medical College, tuberculous contralateral bronchial infection occurred in 500 instances. In 22 of these cases, one lung was clear on the first examination. In this smaller group, 73 per cent had the primary lesion in the right lung; 90 per cent had cavitation; only 13 per cent had no tubercle bacilli in the sputum; 40 per cent had normal temperature; and 50 per cent presented no physical evidence of the new lesion. In more than 90 per cent, the contralateral infection was localized in the second interspace on the right, and the third interspace on the left side. Among the 500 cases, 220 others had available adequate clinical records showing that 96 per cent had cough; 97 per cent, sputum; 73 per cent, fever; 20 per cent, râles alone; 49 per cent, râles plus other abnormal physical signs; 92 per cent (of 118 cases), tubercle bacilli in the sputum; 89 per cent, cavitation on the primary side; and in 68 per cent, the right side was primarily involved. In this group, 94 per cent of the contralateral infections were found in the

areas of predilection, the second interspace on the right, and the third interspace on the left side. The axillary area is most likely to show abnormal physical signs of the new lesion. It is usually peripherally situated, indicating that the infectious material is aspirated into the air vesicles proper. Conditions are best for spilling during sleep and when the cough reflex is otherwise suppressed. The lung which has an open tuberculous cavity should be kept in a dependent position when the patient reclines.—*Contralateral Bronchial Infection in Pulmonary Tuberculosis, A Study of 242 Cases, C. Wu & B. H. Y. Tang, Am. J. Roentgenol., February, 1937, xxvii, 180.*—(*E. M. J.*)

Tuberculosis of Apex.—There is a confusion of terms applied to that area in the lung where early tuberculous infiltration most frequently occurs. French authors speak of the *sommet pulmonaire.* By this they mean all of the conical part of the upper lobe lying within five centimetres of the extreme peak. On the other hand the German authors reserve the term apex for that portion of the upper lobe lying above the clavicle, and style subapical infiltrations appearing below the clavicle. This has given rise to some misunderstanding, for the Germans maintain that the earliest infiltrations occur chiefly below the apex. Anatomical studies of lungs with supernumerary fissures and supplementary lobes indicate that there is a well defined region of the lung having its own bronchial trunks which might properly be called the apex. The lower border of this region is at the level of the second rib. Clinically the French have always emphasized the importance of searching for signs of early infiltration just above and below the clavicle anteriorly and in the corresponding region posteriorly. The findings at the autopsy table have confirmed the wisdom of directing the clinicians' attention to this area. Those who lay great emphasis on infraclavicular infiltration do so largely because of studies of roentgenograms. It must be remembered, however, that the usual technique employed for making a roentgenogram of the chest requires the patient to assume a most unnatural posture. This posture causes the upper part of the lung to be tilted forward. Therefore, lesions of the summit of the lung appear to lie lower in relation to the posterior portion of the first and second ribs than is anatomically the case when the lung is in its normal position.—*La tuberculose primitive du sommet et la conception territoriale de la structure du poumon, Pierre Weber, Arch. Méd. Chir. l'App. Resp., 1936, xi, 429.*—(*C. L. D.*)

Predisposition of Upper Parts of Lungs to Tuberculosis.—In man there occurs some orthostatic displacement of the blood toward the abdomen and lower extremities with impairment of the circulation. This shift is usually so insignificant that it causes no discomfort. In certain animals, however, the upright position produces such a marked circulatory disturbance that death ensues. In man there also occur severe types of such disturbance with extreme reduction of the minute volume. The author has applied the term "orthostatic arterial anaemia" to all cases showing objective symptoms and specific discomfort that result from the diminution in the minute volume when standing. The borderline between the normal and pathological is however not at all sharp. It is possible to distinguish a constitutional orthostatic from a conditional orthostatic arterial anaemia. The conditional type may be compared to Stiller's asthenic habitus and related constitutions. Both the constitutional and the conditional types are met with in the types of constitution, age periods, and normal or pathological conditions which are assumed to predispose to pulmonary tuberculosis. Such are *habitus asthenicus*, menstruation, climacterium, the period after childbirth, debilitating diseases, conditions of hunger, etc. The same asthenic discomfort and symptoms as are seen in the asthenic disease and orthostatic arterial anaemia are often exhibited by patients with florid pulmonary tuberculosis and are incorrectly interpreted as due to tuberculosis. Static displacement of the pulmonary blood takes place in all individuals but it occurs most frequently in patients with a pronounced orthostatic arterial anaemia where it can be roentgenologically demonstrated. The author believes that poor circulation in the upper parts of the lungs when the body is in an upright position is an important agent in causing an increased susceptibility of these areas to tuberculosis in both adolescents and adults. In prophylaxis and therapy these facts must be taken into consideration. According to the author the resistance of the basal pulmonary regions, which shows an increase with age, depends upon nonspecific and specific immunity to tuberculosis.—*Die Disposition des Lungenobergeschosses zur Tuberkuloseerkrankung, ein zentrales Problem der Tuberkuloseforschung, H. Laurell, Acta Radiologica, February 1, 1937, xviii, 341.*—(*F. G. K.*)

Pulmonary Tuberculosis in Senescence.—Although this disease has not in the past been regarded as an evil common in old persons, more careful study of mortality

rates and increased routine use of chest X-ray films are changing our ideas about this. The textbooks on medicine and diseases of the chest yield meagre information because abnormal physical signs in the chests of the aged are masked by the presence of emphysema or shallow type of breathing. The advent of pulmonary tuberculosis often complicates beyond solution problems already presented by a weak heart and sclerotic kidneys and arteries. The pressing problem is more the protection of others from infection than special individual treatment. In most cases the length of the history indicates that senile pulmonary tuberculosis is a chronic disease originating in early life, and this is supported by roentgenographic evidence of intense fibrosis. The few cases examined at necropsy have shown cavities surrounded by thick fibrous walls; a terminal miliary tuberculosis may, of course, occur. The old-age type of pulmonary tuberculosis is very common in the mining industrial regions and is probably secondary to silicosis. There is usually a history of cough, noted for many years, rather mild, more or less productive, and usually worse in winter. Dyspnoea is common, also occasional slight haemoptyses. With progression of the disease, and advancing age, symptoms of cardiac failure become manifest and finally dominate the clinical picture. Evidence of focal disease in the lungs is usually masked by the presence of emphysema and shallow breathing. The patients are usually thin and underweight and may show tachycardia and occasional elevation of temperature. Chronic bronchitis is the condition most commonly confused with senile phthisis but X-ray and sputum examination should differentiate them. Haemoptysis in old age should cause suspicion of bronchial carcinoma unless some other cause can be demonstrated. Many cases of senile phthisis have been discovered by examination of contacts; others by the finding of tuberculosis elsewhere, such as in the larynx, leading to a careful check-up of the lungs. Such widespread pathology is often demonstrated by the X-ray that it seems incredible that it should not be detectable by good clinicians. Such factors as the circulation and general condition are more important than the amount of lung involved. Any degree of cardiac failure is especially serious. Sanatorium treatment is unnecessary but sleep, fresh air and good food should be provided. The hygiene of the sputum should be carefully directed and supervised. The chief efforts should be to check the spread of tuberculosis rather than to heal the disease in a subject nearing the end of the normal span of life.—*Senile Pulmonary Tuberculosis, F. P. L. Lander, Brit. J. Tuberc., October, 1936, xxx, 183.*—(*A. P.*)

Miliary Pulmonary Tuberculosis with Complete Recovery.—The course and ultimate outcome of this case seems quite unique. Ten cases are on record in which miliary pulmonary tuberculosis is known to have healed and in all of these the X-ray revealed either gross resultant fibrosis or calcification. In this case, however, there was left no roentgenographic evidence of tuberculosis and the final appearance might well be considered normal. *Case Report:* A single girl, aged 22, nurse in one of the London County Council mental hospitals, first came under observation November 15, 1934, having noticed undue fatigue, especially late in the day, for five months. Two months later there developed enlarged cervical lymph nodes on the right side and a few weeks later on the other side as well. Early in November she went home to Ireland for a holiday but felt worse and developed a sore throat. Evening pyrexia about 100° F. was found and there were backache and frontal headache. The family history revealed that an older sister had developed pulmonary tuberculosis at the age of 22, had been a nurse in the same hospital and had some contact with the patient. A chest X-ray film of the patient on admission to the hospital showed findings indicative of miliary pulmonary tuberculosis. The only physical sign in the chest was an occasional crepitation in the right suprascapular region. In the absence of sputum the stools were examined and tubercle bacilli were found, but the stomach washings were negative. After administration of small doses of potassium iodide for a week large numbers of tubercle bacilli were found in the sputum. Red blood cell sedimentation was considerably increased. A relapsing pyrexia suggestive of the Pel-Ebstein type existed. After three months, following an attack of acute tonsillitis, tonsillectomy was performed and the patient was transferred to the Royal National Sanatorium at Bournemouth where she did well except for a fibrinous pleurisy in August, 1935. She returned to London in February, 1936. Her state of health has remained excellent. She later showed absence of signs and symptoms and a practically normal X-ray film.—*Complete Recovery from Miliary Tuberculosis of the Lungs, J. Maxwell, Brit. J. Tuberc., October, 1936, xxx, 228.*—(*A. P.*)

Chronic Miliary Tuberculosis.—The characteristic things about chronic miliary

tuberculosis are the great variety of clinical forms, and the rarity of symptoms and physical signs in the lungs. Sudden or slow loss of weight and asthenia are common. The inoculation or culture of the sputum is important for diagnosis, when direct examination fails to reveal the bacilli. Analysis of gastric contents is very important, since so many of these cases have no expectoration. The pulmonary lesions may be minimal and invisible. In a general way it may be said that cases with gland, bone, skin or genitourinary lesions show pulmonary lesions during a relatively advanced stage of the disease, while cases with pleural, intestinal or laryngeal manifestations show early pulmonary involvement. The finding of tubercle bacilli in the gastric contents of cases with pleuritic manifestations shows the frequency of lung complications, even when the X-ray is negative. In cold granulia, the lesion progresses very slowly, and it tends to improve even after reaching the more advance stages. The symptoms are mild: slight cough, little or no expectoration, asthenia and loss of weight, small haemoptyses, no fever. The X-ray picture shows nodular, fine, diffuse infiltration in both lungs, with limited zones of superficial exudation. The haematogenous character of a tuberculous lesion depends on the nature of the infection and the age of the patient. The more prolonged and massive the contagion, the greater the probabilities of haematogenous dissemination. It is more frequent at those ages when the organism is least resistant to tuberculosis: infancy, puberty, maternity in women, extreme old age. Traumatism and seasonal variations have some influence. There are cases in which the fine miliary lesion is associated with ulcerative processes, the latter predominating. Among the remedial measures, sanocrysin has given excellent results in many cases.—*Tuberculosis miliar crónica, L. Sayé, Rev. Med. de Barcelona, May, 1936, xxv, 387.—(J. R. P.)*

Working Capacity of Patients with Pulmonary Tuberculosis.—This question has both anatomical and physiological, as well as psychological, aspects. The victims of acute forms or phases of tuberculosis are, of course, completely incapacitated. On the other hand, those with healed primary foci have undisturbed working capacity, although there may be periods of perifocal reaction (or extension) when they cannot work. No one can predict the future for an individual with a healed primary complex, nor is it necessarily related to present working capacity. In cases of open tuberculosis, some would expend all effort to render the sputum negative, even at the expense of complete incapacitation. Village Settlements, however, do not hold to such principles. Response to effort may be used as a physiological criterion after determining the anatomical status. No febrile patient is fit to exercise, as this means adding the burden of fatigue toxins. Varrier-Jones has devised a "Quasi-Continuous Temperature Recorder" which records temperatures from a rectal thermometer at half minute intervals. This showed a disturbed sleep plateau in the presence of early or slight toxaemia. Endocrine factors are not sufficiently considered. All sanatorium superintendents are familiar with the oldest inhabitant, proud of weight gains, little trouble but devoid of ambition. Such patients may well work but need urging. Psychological factors necessitate observation and assessment of the qualities and character of the individual patient. It is remarkable how patients with the most worthy characters make the best clinical progress. Their limitations are fundamentally anatomical.—*Capacity for Work in Pulmonary Tuberculosis, L. B. Stott, Tubercle, September, 1936, xvii, 543.—(A. P.)*

Capacity for Work in Pulmonary Tuberculosis.—The first essential in the treatment of the sick is an inborn faculty for handling the patient with appreciation of his individual peculiarities. Along with this there should be a gradual accumulation of rational knowledge based upon study of exact sciences and their application to the human body and its mechanisms and functions. Few satisfactory results can be achieved which are not a resultant of these two essentials. The term "capacity for work in tuberculosis" probably connotes in most of our minds a varying fitness for physical exertion, the degree of which must be gauged and controlled. The Oxford Dictionary defines work as "expenditure of energy, application of energy to some purpose," etc. However, there are forms of expenditure of energy difficult to assess, still more so to measure, such as grief, shock, mental and emotional stress. That these may affect a potentially active infection there is little doubt, hence we must from the outset consider all forms of energy, physical, physiological and psychological. It is difficult to grade mental or emotional work as is done with the purely physical; yet the higher and more sensitive the patient, the more important it is to consider these forms. A job involving perhaps more bodily exertion than strictly desirable may be less injurious than a lighter one involving mental or emotional strain or dislocation. To revert

to more readily comprehensible criteria, the information afforded by frequent X-ray examinations is most important, as fresh secondary lesions or extensions may be unattended by clinical manifestations. Such infiltrations may clear up rapidly when the patient is put on strict rest. For special institutions and settlements, suitable patients should be selected. Patients should not be urged to forms of work for which they have little or no aptitude, as the resulting disorientation and unrest will react unfavorably, even inducing relapse. Discontent is a source of worry and worry breeds ill health.—*The Capacity for Work in Pulmonary Tuberculosis, M. Davidson, Tubercle, September, 1936, xvii, 538.*—(*A. P.*)

Pulmonary Tuberculosis and Pregnancy.—The most significant question relating to pulmonary tuberculosis and child-bearing is: "Does child-bearing lessen the mother's resistance to the tuberculous infection?" This might be divided into three subheadings: (*1*) Does child-bearing activate latent, arrested or quiescent lesions, and if so in what degree? (*2*) Does child-bearing accelerate the progress of active pulmonary tuberculosis and precepitate a fatal issue? (*3*) Is it beneficial to the mother (if the other answers are negative)? Leyland Robinson believes the first appearance of tuberculosis during pregnancy indicates a previously latent lesion. On the other hand, arrested or quiescent lesions are those which once presented positive evidence of active disease but are now free from this. In any comprehensive study of tuberculosis and pregnancy it is necessary to pool results for a sufficient number of cases for statistical analysis; but such pooling is unsatisfactory because of the enormous variables in separately published groups of cases. Leyland Robinson's attempt to circumvent this difficulty by obtaining the views of 200 experts from all over the world is open to the criticism that if individual opinions are based on inadequate data the sum of these is no more trustworthy. Bridgeman and Norwood's paper, based on the notes of 14,000 maternity cases in Baltimore, of which 134 were considered to have pulmonary tuberculosis, is cited as one of the best, as the cases are well classified in different groups. Healed and "questionable" tuberculosis, comprising 67 cases, seemed to be unaffected by pregnancy, even under adverse social and economic circumstances. There were 31 patients with active pulmonary tuberculosis and the figures strongly suggest that pregnancy diminished their chances of recovery. The figures of Forssner and of Rist are also cited. More recently Ornstein and Kovnat published the results in 85 cases over a period of ten years, with 31 deaths, all among a group of 51 patients with caseous-pneumonic type lesions, compared with 23 out of a similar number of nonpregnant females. Thus, the available statistical evidence suggests that in active pulmonary tuberculosis pregnancy aggravates the disease and accelerates its fatal termination. The type and extent of the disease and sort of treatment available appear to be very important factors; also the strain of labor with compression and decompression of the lung, and the anxieties associated with the management of the child. That pregnancy may exert a specific effect is suggested by Nobécourt and Paraf's findings of decreased skin sensitivity. Contraception and sterilization must here be considered and in so doing we should purge our minds of all religious, moral and political objections. Sterilization, however, involves procedures which carry some degree of risk. First to be considered in therapy, is the treatment of the patient suffering from active pulmonary tuberculosis who is incidentally pregnant. Strictest sanatorium principles must be applied and such measures as artificial pneumothorax should be considered. Rist and Jottras have well set forth its advantages in 132 cases of whom 58 became pregnant subsequent to such treatment and 74 had the treatment begun during pregnancy. The more recent the tuberculosis and the shorter the period of treatment the poorer the results. Other surgical procedures are also to be considered in certain cases. Statistics on the effects of abortion are difficult to evaluate. As to the children, both Armand-Delille and Forssner have shown that the important thing is complete and immediate separation.—*Pulmonary Tuberculosis and Pregnancy, H. Cohen, Brit. M. J., October 17, 1936, no. 3954, 751.*—(*A. P.*)

Pregnancy and Tuberculosis.—The problem of pregnancy and tuberculosis is very complicated; statistics are incomplete and often unreliable; experiences differ, largely due to lack of standardized classification and procedure; opinions are diverse. Little has been done for the unfortunate gravida who has pulmonary tuberculosis. Only ten per cent of the tuberculosis sanatoria admit or retain pregnant women and take care of them through their delivery. In those that do, it is probable that there is inadequacy of treatment from the obstetrical standpoint. It is proposed that special institutions be established devoted exclusively to the care, treatment, and study of tuberculous gravida under the direction

of obstetricians, pediatricians, internists, and laboratory workers who are interested in the problem. Or that interested hospitals set aside a certain number of beds under the joint control of a tuberculosis specialist and an obstetrician interested in tuberculosis. The effect of pregnancy on tuberculosis is variable. Much confusion and many discrepancies continue to permeate most of the published reports. "When all is said and done" there has been sufficient evidence adduced to warrant the statement that pregnancy does exert a deleterious effect upon tuberculosis in a certain proportion of cases, but it also exerts a beneficial effect on certain other cases. The effect of tuberculosis on the course of pregnancy is practically nil. There is no effect on fecundity, the development of the foetus is normal, abortion or premature labor is no more frequent than in the nontuberculous except in those cases with severe exhausting cough, haemoptysis, fever, and marked general debility. Mild inactive tuberculosis seems to have no effect upon the puerperium, haemorrhage is no greater and involution is not retarded. In the more active and progressive cases there is apt to be excessive haemorrhage and involution may be tardy. The baby should never be allowed to nurse except perhaps where the mother has a minimal healed lesion. Pregnancy complicating laryngeal tuberculosis is very bad, the mortality is said to be from 85 to 100 per cent. The active treatment of pregnancy complicated by tuberculosis divides itself into general and obstetrical considerations. The general treatment is identical with that for any nonpregnant patient. Obstetrical management involves first the question of interruption of pregnancy and the best methods of accomplishing this. The valid indications for interruption are that the gravida is in immediate danger of dying or prophylactic purposes, in instances in which gestation and labor may be expected to cause progression of the disease. During the first 12 to 16 weeks of pregnancy therapeutic abortion is indicated in all proved active cases whatever its stage. Advanced inactive cases should be aborted early and sterilized. An "arrested" moderately advanced lesion, after two, three or four years of quiescence, is almost sure to remain inactive if pregnancy ensues. If activity should become apparent during the first sixteen weeks of pregnancy, abortion must be performed immediately. Interruption during the first 8 or 10 weeks can oftentimes be done by the use of cervical and vaginal pack followed by curettage under local or gas-oxygen anaesthesia. From the twelfth to the sixteenth weeks anterior hysterotomy, under local, spinal or sacral anaesthesia, is the best operation, except in certain multipara where the cervix is very soft and dilatable and cervical and vaginal pack followed by curettage may be done. From the sixteenth to the twenty-eighth week, artificial interruption should rarely be undertaken except in active cases where the patient is growing worse very rapidly. In this period vaginal caesarean section or radium or X-ray irradiation are the procedures of choice. From the twenty-eighth to the fortieth week nothing can be done that will improve the condition. Operative interference is almost sure to terminate fatally except in very few selected instances. At term, the labor should be made as easy and short as possible. If labor pains are regular and at frequent intervals, and the cervix dilated, morphine-scopalamine analgesia or its equivalent should be employed to relieve the stress and strain of labor. As soon as the cervix is fully dilated, rupture of the membranes, episiotomy with application of forceps and immediate delivery using gas-oxygen or cyclopropane is the procedure of choice. In the presence of a normal pelvis and baby, with fully dilated cervix and ruptured membranes, pituitrin may be given, and this with episiotomy and anaesthesia will accomplish delivery in the shortest possible time and with the least shock to the mother. If there is disproportion between the child and the pelvis or other cause for apprehension as to the outcome of the labor, caesarean section, under local or gas-oxygen or cyclopropane anaesthesia should be done. Vaginal caesarean section should not be done after the seventh month of gestation. The question of sterilization is most important. Due to its psychic trauma, it should not be carried out as a permanent measure except in those in whom menstruation is slowing up the recovery of their tuberculosis to an unreasonable degree. In some instances temporary sterilization by radium or X-ray may be performed. In advanced cases, especially with cavitation, pregnancy is absolutely contraindicated. In the moderately advanced active cases, it is very dangerous. If the moderately advanced case has been arrested for three to four years, and the general health has remained satisfactory, pregnancy may be undertaken with comparative safety.—*Pregnancy and Tuberculosis, H. B. Matthews, Am. J. Surg., February, 1937, new series xxxv, 293.*—(*A. E. M.*)

Pulmonary Tuberculosis and Pregnancy.—A most significant fact is the devastating influence of labor and the

puerperium on the course of pulmonary tuberculosis. In a careful study of 46 cases by Young there were 14 deaths, or 30.4 per cent; of these, 12, or 85.7 per cent, died within two years of confinement. Many observers have also noted that a latent tuberculous lesion may first reveal itself subsequent to childbirth. Among the same 46 cases observed, in 27, or 58.6 per cent, there was definite deterioration in the clinical condition during the puerperium. In 17.4 per cent, death occurred within three and a half months. Rist, at the Edinburgh meeting of the British Medical Association in 1927, stated that of 52 tuberculous women who became pregnant, the disease was aggravated in 44, or 84.6 per cent, and 19, or 36.5 per cent, died within one year; further, of 55 women who first developed symptoms of pulmonary tuberculosis during pregnancy 22, or 40 per cent, were dead within one year. It is curious that the clinical features of pulmonary tuberculosis often may abate during pregnancy, only to increase in intensity after labor. Many specialists believe that the upward rise and splinting of the diaphragm, restricting pulmonary movement, with the sudden subsequent release, added to the straining during delivery, may be important factors. While it is true that a certain proportion pass through labor and the puerperium unharmed, most active cases are adversely affected and even quiescent and latent lesions may be stirred into activity. It cannot be denied that in many respects the management of the phthisical woman who becomes pregnant suffers from dual medical control and poor coördination. The delivery of such women should become a function of the sanatorium. Women with active pulmonary tuberculosis should certainly be dissuaded from marrying and, if married, from bearing children. Three years' freedom from all symptoms and satisfactory X-ray and other evidence of healing should be demanded at least. In urgent cases, sterilization by operation or radiation may be employed. In other cases, birth control instruction is called for. Abortion is fully justified in the case of an undesirable pregnancy in a woman who has recently passed through a gestation, ending in a turbulent puerperium. In the less severe grades of the disease termination of pregnancy in the early months is associated with less risk than delivery at a later period. To give maximum protection the abortion should take place within the first three months and the earlier the better; however, in suitably selected cases abortion even in the fourth or fifth month may give some protection. The emptying of the uterus during the early months must be done carefully and skilfully, with as little risk of shock and loss of blood as possible. Evacuation by abdominal hysterotomy, especially under spinal anaesthesia, is quick, safe and relatively bloodless; also, sterilization can be done at the same time. When done by the vaginal route two stages should be adopted, the first being cervical dilatation by two or three laminaria tents, the second, twenty-four hours later, the evacuation. Avertin given rectally, reinforced if necessary by gas-oxygen, is safe and suitable. For cases with severe pulmonary lesions, and all seen in the latter part of pregnancy, gestation should be allowed to continue and treatment directed toward building up the patient's health and combating her disease. This includes artificial pneumothorax in suitable cases. During delivery the anaesthesia should be carefully selected and administered and the patient protected against haemorrhage, shock and sepsis. Lactation should not be allowed and if possible the child should be completely removed from the mother.—*Pulmonary Tuberculosis and Pregnancy, J. Young, Brit. M. J., October 17, 1936, no. 3954, 749.*—(*A. P.*)

Endocrine Glands and Tuberculosis.—The literature is extensively reviewed. Following this the author reports fifty cases of pulmonary tuberculosis in which it was possible to establish the following endocrine syndromes: hyperpituitary, 2 cases; hyperthyroid, 6 cases; hyperthyroid-hyperthymic, 12 cases; hypergenital, 10 cases; hypoadrenal, 14 cases two of which had an associated hypopancreatism; hypogenital, 4 cases; and hypopituitary, 2 cases. This study showed that the mild cases tending to fibrosis and a chronic course were hyperthyroid. The hyperpituitary cases have a good resistance. The hyperthymic cases have a diminished resistance, but they also have a tendency to obesity while undergoing successful treatment in a sanatorium. The hypopituitary cases are fat, flabby and have usually some evidence of the hyperthymic state. The hypergenital cases have an excellent tendency to heal in spite of the type of involvement being of a very serious nature. The hypogenital cases are weak even in the presence of a very slight infection. A serious infection completely breaks down their resistance. The hypoadrenal cases have a bad prognosis.—*Les glandes endocrines et la prédisposition à la tuberculose, O. M. Mistal, Arch. Med. Chir. l'App. Resp., 1936, xi, 189.*—(*C. L. D.*)

Incidence of Pulmonary Tuberculosis in Cases of Congenital Heart Disease.—Many years ago Rokitansky stated, as a result of experience of 30,000 postmortem examinations, that all forms of cardiovascular or pulmonary disease causing cyanosis were incompatible with tuberculosis, especially congenital heart lesions. Peacock, of London, later investigated this question and questioned Rokitansky's dictum. On the other hand, Humphry in England, Fishberg and Norris in the United States, held tuberculosis especially common, especially in those with pulmonic stenosis who survived the first few years, and Fishberg regarded the pulmonary oligenia as favorable to its development. Cabot, in the material at the Massachusetts General Hospital, Boston, reported findings more similar to those of Rokitansky. Gloyne, in this study, examined the necropsy records at Victoria Park Hospital, London, from 1889 to 1935 inclusive. Among 2,735 cases there were 21 with presumably congenital heart defects, about one in 130 in a chest hospital series. These he divides into 3 groups, according to recorded presence or absence of cyanosis or unrecorded. *Summary: 1:* Of 21 cases of congenital heart disease in 2,735 necropsy records, 6 showed tuberculous pulmonary lesions and one a doubtful one (33 per cent). *2:* Only one case of pulmonic stenosis showed such lesions and there was no record as to cyanosis. *3:* Six cases with cyanosis were all free from tuberculosis. *4:* Of the other 6 cases showing tuberculosis (one doubtful), five had patent foramen ovale or defective interauricular septum, types of lesion often causing little circulatory disturbance. Correlation of these findings is difficult, but Rokitansky's original view seems to have some foundation. The number of cases of pulmonic stenosis is too few for any conclusion. The work of Lundsgaard and Van Slyke on haemorespiratory exchange in congenital heart disease is discussed. With cyanosis there is a low alveolar carbon dioxide and low oxygen saturation of arterial blood.—*Congenital Heart Disease and Pulmonary Tuberculosis, S. R. Gloyne, Tubercle, July, 1936, xvii, 455.*—(*A. P.*)

Bovine Pulmonary Tuberculosis.—Of 33 cases of pulmonary tuberculosis found to be due to bovine tubercle bacilli, 29 were probably caused by infection of man by cattle. Moreover, 30 of the patients had drunk only raw milk. Clinically the course and progress of the bovine type of pulmonary tuberculosis was similar to that of the human type.—*33 Fälle von Lungentuberkulose verursacht durch den Typus Bovinus, P. Mourier, Acta Tuberc. Scandinav., 1936, Fasc. 4, x, 356.*—(*F. B. S.*)

Active Tuberculosis and Schizophrenia.—It has been generally accepted that psychic and somatic phenomena are closely interrelated; thus studies of the incidence of somatic disease in patients with mental disorders become important and tuberculosis is especially a fruitful object of study because of its wide distribution and ample general statistical data regarding it. That patients with schizophrenia are especially prone to develop active tuberculosis is generally accepted but it is a question whether this is due to incidental factors or to constitutional predisposition. Dementia praecox is among the so called noncompensatory or decompensating psychoses and at the somatic level there is a similar type of reaction to tuberculous infection. To some the association of tuberculosis and schizophrenia has suggested that the latter may be caused by the toxic effects of tuberculosis, but there has been no general agreement on either this point or the actual frequency of association. A survey of the deaths from tuberculosis occurring in the Foxborough State Hospital from 1920 to 1934 inclusive showed that tuberculosis accounted for 102 of 1,016 fatalities, approximately 10 per cent, and all but 6 were cases of active pulmonary disease, the others being renal and miliary tuberculosis. During the entire period the average death rate from tuberculosis was 6.5 per 1,000 patients, but it decreased from 9.93 for 1920–1924 to 4.79 for 1930–1934. Of the whole tuberculous group, 63.7 per cent had been diagnosed as schizophrenics and the average time spent in the hospital before tuberculosis was detected was about five years and the average duration of the disease about six months, there being no significant difference between schizophrenic and nonschizophrenic groups in either respect. During the same period 373 necropsies were performed on schizophrenics and 45, or 12 per cent, showed active tuberculosis. *Discussion:* These figures probably represent an average sample for this group and agree fairly well with those of comparable studies, especially those of Warren and Canavan in Massachusetts. Freeman's figures of 17 per cent of active tuberculosis on necropsy came from a group containing a larger proportion of Negroes, whose tuberculosis mortality far exceeded that of the whites. The tuberculosis mortality among these mental patients appears to have been approximately eight times that in the adult

population of Massachusetts for the first five-year period, and 6.4 times greater during the final period. Malzberg, in New York State, has found the excess, for the years 1929–1931, 11.7 to 1, but the death rate from all causes was also increased, the ratio being 7.4 to 1. After correction for age difference he found it 4.7 to 1. In Massachusetts the difference was approximately 4 to 1. Tuberculosis occupies first place in the list of causes of death in dementia praecox and one-third of patients with this psychosis who died in this period showed active tuberculosis, compared with only 4.5 per cent for those with other psychosis. However, certain discrepancies are here pointed out: (*1*) The schizophrenic group accounted for only 19 per cent of total deaths, although comprising 51.6 per cent of the total hospital population. (*2*) Patients with schizophrenia remain a considerably longer time on the average, thus giving a longer period for the development of tuberculosis. (*3*) Patients with other types of psychosis are subject as a group to a very high general mortality. The view that dementia praecox is actually caused by the toxic effects of tuberculosis is open to so many objections that it must be rejected. However, the question of predisposition is more difficult. A study of the 65 cases of dementia praecox with active fatal tuberculosis showed that hardly any had made any degree of successful adjustment to their comparatively simple environment and displayed profound deterioration with little ability to retain or develop interest in the outside world. Most had been idle, inactive, and apathetic for years; only 11 had engaged in any work immediately prior to the onset of their tuberculosis, and in these it had usually been poorly performed. On the other hand, of the entire male schizophrenic population, over 50 per cent were regularly employed and useful. It seems justifiable to conclude that tuberculosis occurs in the group with the least active tendency to recover mentally, that is, the "decompensating" group. Also, Luxemburger's work appears to show that tuberculous disease is commoner among siblings of schizophrenics than in the general population. The other factors of unhygienic mode of life and prolonged hospitalization must also be considered. Finally, in the period considered the hospital tuberculosis mortality has dropped over 50 per cent, the general adult tuberculosis mortality (for Massachusetts) about 40 per cent. Part of the former decrease is attributed to more adequate housing, increase of emphasis on outdoor activities, and earlier segregation of cases of active tuberculosis.—*Frequency of Active Tuberculosis in a Hospital for Mental Diseases, With Special Reference to Schizophrenia, D. Rothschild & M. L. Sharp, New England J. Med., May 7, 1936, ccxiv, 929.*—(*A. P.*)

Silicosis and Tuberculosis.—Marked exception is taken to the apparently almost universal belief that most patients with silicosis die of tuberculosis. From statistical studies it is educed that the incidence of tuberculosis among workers exposed to silicon dust is probably no greater than in workers in other occupations and that the death rate from tuberculosis in this class of workers has never exceeded one per cent in any one year. There is no evidence to support the idea that patients with silicosis have increased susceptibility to tuberculosis. In ninety-six cases of supposed silico-tuberculosis at Sea View and Metropolitan Hospitals, twenty-eight had negative sputum and no manifestations of clinical tuberculosis; but all had been referred as having far-advanced tuberculosis. A diagnosis of tuberculosis in silicotic patients should not be made unless tubercle bacilli can be demonstrated in the sputum. In only five out of fifty-eight cases correctly diagnosed as silico-tuberculosis, was the tuberculosis atypical; in the remaining cases the disease was caseous-pneumonic in type with cavitation in the upper lobes. In four of the five atypical cases there was roentgenographic evidence of lower lobe cavitation; in the fifth tuberculous Pott's disease and miliary tuberculosis were disclosed. In sixteen cases of tuberculosis and silicosis proved by postmortem examination, tubercle bacilli had been readily found before death. In both tuberculosis and advanced silicosis, the clinical features, physical signs, and roentgenographic findings may be almost identical. In an individual with a history of exposure to silicon dust, it is difficult, and almost impossible, to disprove silicosis without an autopsy. Two such cases are described.—*Tuberculosis and Silicosis, G. G. Ornstein & D. Ulmar, Quart. Bull. Sea View Hosp., October, 1936, ii, 28.*—(*A. A. E.*)

Results of Tuberculosis Eradication in Cattle.—In 1908, 0.9 per cent of all cattle slaughtered under federal inspection showed lesions of tuberculosis. In 1916, the percentage had increased to 2.3 and 30,720 cattle and 74,109 hogs were condemned as inedible, the equivalent of a trainload 20 miles long. Since 1916, 3,500,000 reacting cattle have been removed from herds of the United States following tuberculin tests. To-day, 43 states and

96 per cent of all countries are accredited as being virtually free of the disease. Four of the remaining states will probably be added within a year. Work in California will require more time because the percentage of reactors is high and there is organized opposition to the program. During the year ending June 30, 1936, 0.18 per cent of all cattle slaughtered, exclusive of reactors, were retained. The cattle and hogs condemned that year would fill a train 3 miles long. The efficacy of the tuberculin test is responsible for the reduction in condemnations. Public health records show a reduction in the death rate from non-respiratory tuberculosis among humans from 22 per 100,000 in 1916 to 5 per 100,000 at the present time. When the entire nation is officially accredited importation of milk and milk products should be prohibited from areas in foreign countries not officially tuberculosis-free. A considerable number of hogs were condemned for the avian type of infection and represents a loss of $2,500,000. The loss to the poultry industry is many times this. Poultry flock owners, by following the program of keeping only young birds, have reduced the prevalence of avian tuberculosis in certain communities. The number of hogs retained for tuberculosis has decreased 50 per cent at Chicago, Sioux City and Omaha during the past 10 years while the decrease for the country as a whole has been only 19 per cent. Of 94,502 birds tuberculin tested in various areas of Illinois, Indiana, Iowa and Nebraska, 14.2 per cent reacting were over 18 months old, and 2.1 per cent were under 18 months old. Of the spring pullets, only 0.5 per cent reacted. In Eastern States, the practice of keeping only young birds accounts for the low percentage of avian tuberculosis. For breeding purposes, where hens are kept for egg laying for more than 1 year, the tuberculin test can be applied yearly. Indiana has 12 commercial hatcheries under test for tuberculosis and *pullorum* disease and Michigan has six. The adoption of a similar plan by other states and the recent plan of selling poultry by grades should help reduce the incidence of avian tuberculosis.—*Problems and Policies in Completing Tuberculosis Eradication, H. R. Smith, J. Am. Vet. Med. Assn., March, 1937, xc, 363.*—(*L. F. B.*)

Tuberculosis Eradication in Cattle.—During the fiscal year ending June 30, 1936, almost 23,000,000 tuberculin tests applied to cattle in many sections of the country disclosed about 165,000 reactors, or 0.7 per cent. Incidence was about one-half that of the previous year. State appropriations for this work were approximately $4,500,000 and the federal appropriation for the year ending June 30, 1937, was $1,500,000. On October 1, 1936, there were about 256,000 fully accredited herds containing 3,750,000 cattle. Most of the testing was done under the area plan. Between November 1, 1935, and November, 1936, 166 counties have been added to the modified accredited list as well as 9 municipalities in Puerto Rico. Twelve states have been added to the list since December 1, 1935. Most of the testing for interstate shipment is done by private practicing veterinarians who tested approximately 265,000 cattle. About 38,000 cattle were tested by employees of the Bureau of Animal Industry. Changes in Regulation 7, B. A. I. Order 309, limit federal restrictions on the movement of cattle from modified accredited areas, but place additional restrictions on cattle moving from localities not in the modified accredited areas. Interstate shipment of cattle is subject to the regulations of the state to which such animals are consigned. A large number of flock owners and agencies interested in poultry and swine have become interested in the problem of avian tuberculosis. Of about 10,000,000 cattle slaughtered under federal inspection, only about 10,000, or 0.19 per cent, showed any evidence of tuberculosis. Of these 4,800, or 0.05 per cent, were either condemned or passed for cooking purposes. There was a slight decrease, 10.26 per cent, in the number of hogs slaughtered showing any evidence of tuberculosis. Johne's disease was reported from 11 states and 134 cattle, or 5.23 per cent of the total cattle tested, were condemned. The average salvage received was $26.50 and the average appraisal was $77.66. Of the reactors slaughtered on which federal indemnity was paid, 4.0 per cent were pure-bred registered cattle.—*Progress and Status of Cooperative Tuberculosis Eradication Work, A. E. Wight, J. Am. Vet. Med. Assn., March, 1937, xc, 353.*—(*L. F. B.*)

Reaccreditation of Range Areas.—The present system of reaccrediting areas is not thorough enough in that the period of reaccrediting is limited to 3 to 6 years and many loopholes are left for new foci of infection to become established and perhaps not be discovered for several years. Postmortem findings as disclosed at all centres where meat inspection is carried on will be a constant and ever alert factor in disclosing foci of disease. It is recommended that a system be inaugurated to report such findings to interested live-stock sanitation officials and that postmortem findings in addition to the tuberculin test should be officially

recognized in the accreditation of range and semirange areas. Under such system the period of accreditation could be extended. Closer coöperation and understanding agreement is desirable between the Meat Inspection Division of the U. S. B. A. I., the Field Inspection Division and State live-stock sanitary authorities. It is recommended that a uniform and adequate system of meat inspection be established throughout the United States and under this a definite system of grading meat be established.—*Reaccreditation of Range and Semi-Range Modified Accredited Tuberculosis-free Areas, W. J. Butler, J. Am. Vet. Med. Assn., March, 1937, xc, 358.*—(*L. F. B.*)

Pathogenicity of Actinomycetes from Soil.—Some of the actinomycetes, a small minority, are acid-fast. As infections of man and animals with organisms of this group occur so seldom and sporadically, it seemed reasonable to think that the natural habitat of these forms might be in the soil from which they were carried into living tissue. Strains of acid-fast actinomycetes from saprophytic (soil) sources were compared with organisms isolated from man and animals, the "pathogenic" type. A cultural study of the soil and "pathogenic" types showed that a close relationship exists between them. In fact, no features were found that would serve to distinguish them. Both the "pathogenic" and soil types are usually pigmented, the colors ranging from yellow, through orange to coral. One of the eight soil types investigated was found to be highly virulent for rabbits soon after it was isolated producing in this species a disease which was indistinguishable from that produced by the "pathogenic" types. The soil types possessed little or no pathogenicity for guinea pigs, whereas the "pathogenic" types produce fatal infections.—*A Study of Some Acid-fast Actinomycetes from Soil with Special Reference to Pathogenicity for Animals, R. E. Gordon & W. A. Hagan, J. Infect. Dis., September–October, 1936, lix, 200.*—(*J. S. W.*)

Veterinary Committee on Tuberculosis.—Information received indicates that 1,944,624 herds containing 22,918,038 cattle were tuberculin-tested during the fiscal year of 1936 with the result that 165,496 or 0.7 per cent gave a positive reaction and were removed from the herds. At the close of June, 1936 there were 256,056 fully accredited herds containing 3,746,955 cattle. Total number under supervision is 6,515,273 herds with a cattle population of 59,907,935. Total number of cattle that have reacted since 1917 amounts to 3,467,185. On July 1, 1936 there were 2,921 modified accredited counties and 40 states were similarly classified. It appears certain that 3 more states will be added to this list shortly. The problem of control and eradication of avian tuberculosis has not yet been satisfactorily solved. Application and interpretation of the tuberculin test is of utmost importance in obtaining maximum results in tuberculosis eradication.—*Report of the Special Committee on Tuberculosis, A. E. Wight, T. H. Ferguson, T. O. Brandenburg, W. Moore & W. H. Feldman, J. Am. Vet. Med. Assn., October, 1936, lxxxix, 455.*—(*L. F. B.*).

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